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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/826,616	04/05/2001	Hugh Anglin	EWG-143 US	4050
23735	7590	04/17/2006		
DIGIMARC CORPORATION 9405 SW GEMINI DRIVE BEAVERTON, OR 97008			EXAMINER THOMPSON, JAMES A	
			ART UNIT 2625	PAPER NUMBER

DATE MAILED: 04/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/826,616

Applicant(s)

ANGLIN, HUGH

Examiner

James A. Thompson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 8-10, 12, 13 and 15-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 8-10, 12, 13 and 15-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Reopening of Prosecution After Appeal Brief

1. In view of the appeal brief filed on 02 February 2006, PROSECUTION IS HEREBY REOPENED. New grounds of rejection are set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:

David K. Moore.



**DAVID MOORE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600**

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Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 15-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The present recitation of claim 15 is unclear as to whether the recited "code for examining" is executed by the recited computer, or if said "code for examining" is a separate entity. Does the computer execute the "code for examining" as it does the "watermark reading program"? It would appear that this would need to be the case, based both on what is generally known to those of ordinary skill in the art and based on the disclosure of the present application (e.g. figures 4-7). However, the present recitation of claim 15 does not clearly set forth that this is indeed the case. Thus, claim 15 as presently recited is vague and indefinite, and Applicant therefore fails to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Claim 16 contains *inter alia* the limitations of claim 15, and therefore also rejected for the same reasons.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -
(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-2, 8, 10, 12 and 22-23 are rejected under 35 U.S.C. 102(e) as being anticipated by Aggarwal (US Patent 6,834,344 B1).

Regarding claim 1: Aggarwal discloses digitally watermarking an image (figure 3(206) and column 6, lines 59-63 of Aggarwal), said watermark being redundantly applied in areas of said image (figure 3(201-205); and column 6, lines 48-51 and lines 55-59 of Aggarwal); printing said image on a carrier (column 5, lines 3-6; column 6, lines 30-36; and column 8, lines 50-52 of Aggarwal); acquiring (scanning) a second image of the image printed on said carrier (column 5, lines 3-6; column 6, lines 30-36; and column 8, lines 50-52 of Aggarwal); detecting the digital watermark from areas (column 6, lines 55-57 of Aggarwal) of said second image (column 7, lines 27-32 of Aggarwal); and determining an extent to which the digital watermark is detected in the areas as a measure of quality of the printing (figure 8 (705-707); and column 7, lines 32-35 and lines 64-67 of Aggarwal). The embedded watermark is a semi-fragile watermark (column 6, lines 40-41 of Aggarwal). If a semi-fragile

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watermark is affected such that it cannot be authenticated, then the quality of the image is inherently affected. Thus, the determination as to whether or not the reconstructed watermark is authentic (figure 8(705-707); and column 7, lines 32-35 and lines 64-67 of Aggarwal) is also a measure of the image quality.

Regarding claim 2: Aggarwal discloses that said watermark includes a signal embedded into the image at selected spatial frequencies (column 6, lines 48-51 and lines 55-59 of Aggarwal). As is well-known in the art DCT coefficients are at selected spatial frequencies.

Regarding claim 8: Aggarwal discloses a method of inspecting print quality, the printing including a first image that has been digitally modified to embed a digital watermark signal (figure 3(206) and column 6, lines 59-63 of Aggarwal) and printed on a carrier to create a printed image (column 5, lines 3-6; column 6, lines 30-36; and column 8, lines 50-52 of Aggarwal), the method comprising acquiring (scanning) a second image of said printed image (column 5, lines 3-6; column 6, lines 30-36; and column 8, lines 50-52 of Aggarwal); reading said watermark signal from said second image (column 6, lines 64-65 of Aggarwal) to compute a measure of the digital watermark signal strength embedded in the second image (figure 8(705-707); and column 7, lines 32-35 and lines 64-67 of Aggarwal); and determining quality of said printing from the measure of the digital watermark signal strength (figure 8(705-707); and column 7, lines 32-35 and lines 64-67 of Aggarwal). The embedded watermark is a semi-fragile watermark (column 6, lines 40-41 of Aggarwal). If a semi-fragile watermark is affected such that it cannot be authenticated, then the quality of the image is inherently affected. Thus, the determination as to whether or

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not the reconstructed watermark is authentic (figure 8(705-707); and column 7, lines 32-35 and lines 64-67 of Aggarwal) is also a measure of the image quality.

Regarding claim 10: Aggarwal discloses that said watermark comprises a signal embedded into the image at selected spatial frequencies (column 6, lines 48-51 and lines 55-59 of Aggarwal). As is well-known in the art DCT coefficients are at selected spatial frequencies.

Regarding claim 12: Aggarwal discloses that said watermark is redundantly embedded in multiple areas of said image (figure 3(201-205); and column 6, lines 48-51 and lines 55-59 of Aggarwal).

Regarding claim 22: Aggarwal discloses that the strength of the digital watermark signal in the areas of the image where the digital watermark is redundantly applied (figure 3(201-205); and column 6, lines 48-51 and lines 55-59 of Aggarwal) is used as a measure of print quality (figure 8(705-707); and column 7, lines 32-35 and lines 64-67 of Aggarwal). The embedded watermark is a semi-fragile watermark (column 6, lines 40-41 of Aggarwal). If a semi-fragile watermark is affected such that it cannot be authenticated, then the quality of the image is inherently affected. Thus, the determination as to whether or not the reconstructed watermark is authentic (figure 8(705-707); and column 7, lines 32-35 and lines 64-67 of Aggarwal) is also a measure of the image quality.

Regarding claim 23: Aggarwal discloses that strength is measured as a function of spatial frequencies that have been modified to embed the digital watermark (column 6, lines 55-59 and column 7, lines 64-67 of Aggarwal).

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Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 3, 5, 9, 13 and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aggarwal (US Patent 6,834,344 B1) in view of Austin (US Patent 5,488,223).

Regarding claims 3, 9 and 13: Aggarwal does not disclose expressly that said carrier is a label.

Austin discloses printing on a carrier, wherein said carrier is a label (figure 3b and column 7, lines 56-59 of Austin).

Aggarwal is analogous art since Aggarwal is in the same field of endeavor as the present application, namely embedding, reconstructing, and processing watermark data in digital and document images. Aggarwal and Austin are combinable because they are from the same field of endeavor, namely printing, reading, and processing digital and document image data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to print said watermarked image on a label. The motivation for doing so would have been labels can be used as another form of data storage and entry (column 4, lines 3-5 of Austin). Therefore, it would have been obvious to combine Austin with Aggarwal to obtain the invention as specified in claims 3, 9 and 13.

Regarding claim 5: Aggarwal discloses that said printed carrier (said label as per the teachings of Austin) is evaluated based on the strength of watermark signal detected in the areas as a measure of the quality of the printing (column 7, lines 27-35 of Aggarwal). If a semi-fragile watermark is affected such that it cannot be authenticated, then the quality of the image is inherently affected. Thus, the determination as to whether or not the reconstructed watermark is authentic (figure 8(705-707); and column 7, lines 32-35 and lines 64-67 of Aggarwal) is also a measure of the image quality.

Regarding claim 17: Aggarwal discloses a system (figure 7 of Aggarwal) for inspecting quality of print images, said print images being printed with an image that includes a digital watermark (figure 3(206) and column 6, lines 59-63 of Aggarwal), embedded in areas of said print images (figure 3(201-205); and column 6, lines 48-51 and lines 55-59 of Aggarwal), said system comprising means for acquiring (scanning) an image of said print images after said print images have been printed (column 5, lines 3-6; column 6, lines 30-36; and column 8, lines 50-52 of Aggarwal); means for detecting a watermark signal from the areas (column 6, lines 55-57 of Aggarwal) of said image of said print images (column 7, lines 27-32 of Aggarwal); means for determining an extent to which the watermark signal is detected in the areas as a measure of print quality of said print images (figure 8(705-707); and column 7, lines 32-35 and lines 64-67 of Aggarwal). The embedded watermark is a semi-fragile watermark (column 6, lines 40-41 of Aggarwal). If a semi-fragile watermark is affected such that it cannot be authenticated, then the quality of the image is inherently affected. Thus, the determination as to whether or not the reconstructed watermark

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is authentic (figure 8(705-707); and column 7, lines 32-35 and lines 64-67 of Aggarwal) is also a measure of the image quality.

Aggarwal does not disclose expressly that said print images are specifically labels.

Austin discloses printing images specifically on labels (figure 3b and column 7, lines 56-59 of Austin).

Aggarwal is analogous art since Aggarwal is in the same field of endeavor as the present application, namely embedding, reconstructing, and processing watermark data in digital and document images. Aggarwal and Austin are combinable because they are from the same field of endeavor, namely printing, reading, and processing digital and document image data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to print said watermarked image on labels. The motivation for doing so would have been labels can be used as another form of data storage and entry (column 4, lines 3-5 of Austin). Therefore, it would have been obvious to combine Austin with Aggarwal to obtain the invention as specified in claim 17.

Regarding claim 18: Aggarwal discloses that said digital watermark includes a signal embedded into the image at selected spatial frequencies (column 6, lines 48-51 and lines 55-59 of Aggarwal). As is well-known in the art DCT coefficients are at selected spatial frequencies.

Regarding claim 19: Aggarwal discloses that the strength of the digital watermark signal in the areas is used as a measure of print quality (figure 8(705-707); and column 7, lines 32-35 and lines 64-67 of Aggarwal). The embedded watermark is a semi-fragile watermark (column 6, lines 40-41 of Aggarwal). If a semi-fragile watermark is affected such that it cannot be

authenticated, then the quality of the image is inherently affected. Thus, the determination as to whether or not the reconstructed watermark is authentic (figure 8(705-707); and column 7, lines 32-35 and lines 64-67 of Aggarwal) is also a measure of the image quality.

Regarding claim 20: Aggarwal discloses that the strength of the digital watermark is measured as a function of spatial frequencies that have been modified to embed the digital watermark in the areas (column 6, lines 48-51 and lines 55-59 of Aggarwal).

8. Claims 4 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aggarwal (US Patent 6,834,344 B1) in view of Bhaskaran (US Patent 6,064,764).

Regarding claim 4: Aggarwal discloses that the second image is acquired through digital means (column 6, lines 30-36; and column 8, lines 50-52 of Aggarwal).

Aggarwal does not disclose expressly that said digital means is specifically a digital camera.

Bhaskaran discloses acquiring a watermarked image using a digital camera (column 8, lines 50-56 of Bhaskaran).

Aggarwal and Bhaskaran are combinable because they are from the same field of endeavor, namely embedding, reconstructing, and processing watermark data in digital and document images. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to specifically use a digital camera to capture said second image, as taught by Bhaskaran. The suggestion for doing so would have been that a digital camera is simply one of many possible means that one of ordinary skill in the art at the time of the invention could use

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to acquire a digitized version of the watermarked image (column 8, lines 50-56 of Bhaskaran). Therefore, it would have been obvious to combine Bhaskaran with Aggarwal to obtain the invention as specified in claim 4.

Regarding claim 15: Aggarwal discloses a system (figure 7 of Aggarwal) for inspecting a print image, said printed image including a digital watermark (figure 3(206) and column 6, lines 59-63 of Aggarwal), said watermark being redundantly applied to areas of said printed image (figure 3(201-205); and column 6, lines 48-51 and lines 55-59 of Aggarwal), said system comprising an image capture device (scanner) for acquiring (scanning) an image of said printed image (column 5, lines 3-6; column 6, lines 30-36; and column 8, lines 50-52 of Aggarwal); detecting a digital watermark signal from said areas (column 6, lines 55-57 of Aggarwal) of said image (column 7, lines 27-32 of Aggarwal); and examining magnitude of the digital watermark signal in said areas as a measure of quality of said printing (figure 8(705-707); and column 7, lines 32-35 and lines 64-67 of Aggarwal). The embedded watermark is a semi-fragile watermark (column 6, lines 40-41 of Aggarwal). If a semi-fragile watermark is affected such that it cannot be authenticated, then the quality of the image is inherently affected. Thus, the determination as to whether or not the reconstructed watermark is authentic (figure 8(705-707); and column 7, lines 32-35 and lines 64-67 of Aggarwal) is also a measure of the image quality.

Aggarwal does not disclose expressly that said detecting is performed with a computer that executes a watermark reading program; and that said examining is performed using code.

Bhaskaran discloses performing watermarked image data processing using a computer that executes computer program code (column 8, lines 44-50 of Bhaskaran).

Aggarwal and Bhaskaran are combinable because they are from the same field of endeavor, namely embedding, reconstructing, and processing watermark data in digital and document images. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use a computer that executes computer program code, as taught by Bhaskaran, to perform the steps of detecting and examining taught by Aggarwal. The suggestion for doing so would have been that the scanned watermark data taught by Aggarwal is digital image data and a computer executing computer code is a common, effective and efficient means of processing digital image data. Therefore, it would have been obvious to combine Bhaskaran with Aggarwal to obtain the invention as specified in claim 15.

Regarding claim 16: Aggarwal discloses that said digital watermark includes a signal embedded into the image at selected spatial frequencies (column 6, lines 48-51 and lines 55-59 of Aggarwal). As is well-known in the art DCT coefficients are at selected spatial frequencies.

9. Claims 21 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aggarwal (US Patent 6,834,344 B1) in view of Zhao (US Patent 6,243,480 B1).

Regarding claims 21 and 24: Aggarwal does not disclose expressly that the digital watermark is embedded in a background image.

Zhao discloses embedding a digital watermark in a background image (column 11, lines 16-19 of Zhao).

Aggarwal and Zhao are combinable because they are from the same field of endeavor, namely the embedding and manipulating watermark image data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to embed the digital watermark specifically in a background image. The motivation for doing so would have been to be able to include data such as computer programs in the background of the image (column 11, lines 40-46 of Zhao). Therefore, it would have been obvious to combine Zhao with Aggarwal to obtain the invention as specified in claims 21 and 24.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. Yeung et al, "Digital Watermarking for High-Quality Imaging", *IEEE First Workshop on Multi-media Image Processing*, 1997, 23-25 June 1997, pages 357-362.
- b. Yeung et al, "An Invisible Watermarking Technique For Image Verification", *Proceedings of the International Conference on Image Processing*, 1997, 26-29 October 1997, pages 680-683, volumen 2.
- c. Zheng et al, "Image Quality Measurement by Using Digital Watermarking", *The 2nd IEEE International Workshop on Haptic, Audio and Visual Environments and Their Applications*, 2003, 20-21 September 2003, pages 65-70.
- d. Campaner et al, "Picture Quality Evaluation Strategy Using a Watermarking Technique", *EURASIP Conference focused on Video/Image Processing and Multimedia Communications*, 2003, 02-05 July 2003, pages 721-726, volume 2.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Thompson whose telephone number is 571-272-7441. The examiner can normally be reached on 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K. Moore can be reached on 571-272-7437. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James A. Thompson
Examiner
Technology Division 2625



03 April 2006



DAVID MOORE
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